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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,248	09/30/2003	Peter K. Rogan	33026	5913

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EXAMINER	
POHNERT, STEVEN C	
ART UNIT	**PAPER NUMBER**
1634	

DATE MAILED: 09/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/676,248	ROGAN ET AL.	
	Examiner	Art Unit	
	Steven C. Pohnert	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *1-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/6/06, 9/30/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group 3, claims 34-40, in the reply filed on 6/19/2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 34-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 34 recites, " said individual having either idiopathic mental retardation or mental retardation and at least one other clinical abnormality or cancer." It is unclear if cancer is included as least one other clinical abnormality, or if cancer it a separate qualifying condition.

Claims 34 and 37 recite probes having a length of "less than about 25 kb." It is unclear what is meant by "less then about." For example, are the probes 25kb, longer, or shorter?

Claim 36 recites, "a genomic location or where paralogous sequences are closely linked so that a single hybridization signal is detected." Online dictionary www.biology-text.com defines paralogous genes as: Two genes or clusters of genes at different

chromosomal locations in the same organism that have structural similarities indicating that they derived from a common ancestral gene and have since diverged from the parent copy by mutation and selection or drift. (www.biology-text.com/definition.php?word=paralogous+genes). It is thus unclear how 2 sequences having different chromosomal locations would result in a single hybridization signal.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 34-37 rejected under 35 U.S.C. 102(b) as being anticipated by Rogan, et al (Genome Research, 2001, volume 11, pages 1086-1094).

With regards to claim 34, Rogan et al teaches a method to design and produce custom 2-kb to 10 kb genomic single copy probes to detect genetic rearrangements and common chromosome abnormalities(see page 1086, lines 4-19). Rogan et al further teaches probes to chromosomal regions 15q11.2, 22q11.2, and 1p36 (see page 1091, 1st paragraph of discussion). Rogan et al teaches 22q11.2 probes demonstrate a deletion only in cells from a DiGeorge's patient. Rogan thus teaches methods of screening individuals with DiGeorge syndrome, which is associated with mental

retardation, with probes to detect cytogenetic abnormalities (claim 34) (see 1090 column 2, lines 1-8 and figure 4).

With regards to claim 35, Rogan teaches the 22q11.2 probe hybridizes to both copies of chromosome 22 in control cells, but only 1 chromosome in the DiGeorge Syndrome individual (page 1090, column 2, lines 11-13). Thus the absence of hybridization of the 22q11.2 probe to chromosome 22 associates a hybridization pattern with a specific clinical abnormality.

With regards to claim 36, Rogan teaches single copies probes (see figure 1 and page 1086, column 2 lines 23-24).

With regards to claim 37, Rogan et al teaches a method to design and produce custom 2-kb to 10 kb genomic single copy probes to detect genetic rearrangements and common chromosome abnormalities (see page 1086, lines 4-19). Rogan et al further teaches probes to chromosomal regions 15q11.2, 22q11.2, and 1p36 (see page 1091, 1st paragraph of discussion). Rogan et al teaches 22q11.2 probes demonstrate a deletion only in cells from a DiGeorge's patient. Rogan thus teaches methods of screening individuals of DiGeorge syndrome (known clinical abnormalities) with probes to detect cytogenetic abnormalities (claim 34) (see 1090 column 2, lines 1-8 and figure 4). The absence of hybridization of 22q11.2 to chromosome 22 demonstrates a chromosome lacks this region and is thus imbalanced.

6. Claims 34-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Flint, et al (Nature Genetics, 1995, volume 9, pages 132-140).

With regards to claim 34, Flint et al teaches fluorescence in situ hybridization (FISH) labeled by nick translation (see page 139 first column fluorescence in situ hybridization) and detection of a deletion of 13q region in patient AH, while no deletion was found in parent (see page 133, 2nd column lines 19-24and figure 2b). Patient AH has idiopathic mental retardation (page 133, column 1 line 8). Nick translation results in multiple probes of less then 25 kb. The deletion taught by Flint demonstrates a chromosome 13q imbalance, which is a cytogenetic abnormality.

With regards to claim 35, Flint teaches detection of a deletion of 13q region in patient AH, while no deletion was found in parent (see page 133, 2nd column lines 19-24and figure 2b). Flint teaches patients examined have idiopathic mental retardation (page 133, column 1 line 8). Thus the 13q chromosomal imbalance is a cytogenetic abnormality associated with a specific clinical abnormality.

With regards to claim 36, Flint teaches the D13S107 hybridizes to the 13q arm. Flint thus teaches a single hybridization signal from a plurality of probes to a single chromosomal.

With regards to claim 37, Flint et al teaches fluorescence in situ hybridization (FISH) labeled by nick translation (see page 139 first column fluorescence in situ hybridization) and detection of a deletion of 13q region in patient AH, while no deletion was found in parent (see page 133, 2nd column lines 19-24and figure 2b). Nick translation results in multiple probes of less then 25 kb. The deletion taught by Flint demonstrates a chromosome 13q imbalance.

With regards to claim 38, Flint teaches patients examined have idiopathic mental retardation (page 133, column 1 line 8). As patient AH has idiopathic mental retardation and the deletion detected at 13q, is thus indicative of idiopathic mental retardation. Flint thus teaches the step of correlating chromosomal imbalances to a specific medical condition.

With regards to claim 39, Flint teaches use of nick translated probes, which result in a plurality of probes.

With regards to claim 40, Flint teaches the D13S107 hybridizes to the 13q arm. Flint thus teaches the hybridization of a plurality of probes to a specific chromosomal arm.

7. Claims 34-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Bentz et al (Blood, 1994, volume 83 pages 1922-1928).

With regards to claim 34, Bentz teaches hybridization of nick translated YAC-probe D107F9, results in 2 hybridization signals from normal cells and 3 signals from BCR-ABL cells (see page 1923, column 2, lines 1-4and figures 1 and 2). Nick translation results in a plurality of short probes, all less then 25 kb. Bentz further teaches the 2 signals in normal cells are due to hybridization to chromosome 22 (see page 1923, column 2, lines 4-6 and figures 1) and the third signal is due to a translocation of chromosome 22 to chromosome 9q. Bentz teaches the BCR-ABL translocation detected by the D107F9 is indicative of CML or Ph-positive ALL (see abstract). Bentz thus teaches a method of screening individuals with cancer for

cytogenetic abnormalities using a probe of less then 25 kb. The hybridization pattern of the probes is indicative of cytogenetic abnormalities.

With regards to claim 35, Bentz teaches the D107F9 probe hybridization detects an imbalance in both chromosome 22 and 9 of the BCR-ABL positive cells (see page 1923, column 2, lines 1-4and figures 1 and 2). These imbalances are associated with ALL and CML, which are specific clinical abnormalities.

With regards to claim 36, Bentz teaches the D107F9 probe hybridization detects chromosome 22 of normal cells. (See page 1923, column 2, lines 4-6 and figures 1)

With regards to claim 37, Bentz teaches hybridization of nick translated YAC-probe D107F9, results in 2 hybridization signals from normal cells and 3 signals from BCR-ABL cells (see page 1923, column 2lines 1-4and figures 1 and 2). Nick translation results in a plurality of short probes, all less then 25 kb. Bentz further teaches the 2 signals in normal cells are due to hybridization to chromosome 22 (see page 1923, column 2 lines 4-6 and figures 1) and the third signal is due to a translocation of chromosome 22 to chromosome 9q. Bentz teaches the BCR-ABL translocation detected by the D107F9 is indicative of CML or PC-positive ALL. Bentz thus teaches a method of detecting chromosome imbalances using a probe of less then 25 kb to determine imbalances.

With regards to claim 38, the D107F9 probe detects an imbalance in both chromosome 22 and 9 of the BCR-ABL positive cells (see page 1923, column 2, lines 1-4and figures 1 and 2). These imbalances are associated with ALL and CML, which are cancers.

With regards to claim 39, the nick translated D107F9 probe is a plurality of probes.

With regards to claim 40, the D107F9 is specific to chromosome 22q11, which is a specific chromosome arm. Flint thus teaches the hybridization of a plurality of probes to a specific chromosomal arm.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 34-37 and 39-40 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3 of U.S. Patent No. 7014997. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are co-extensive in scope.

Claim 34 of instant application is drawn to a method of screening individuals with clinical abnormalities with a plurality of probes. The hybridization of said probes resulting in patterns indicative of cytogenetic abnormalities. Claim 3 of '997 patent teaches the detection of hybridization pattern for detection of cytogenetic abnormalities. Claim 1 of '997 patent teaches chromosome abnormalities are indicative of pathological abnormalities.

Claim 35 of instant application is drawn to associating hybridization patterns of probes with clinical abnormalities. Claim 1 of '997 patent teaches hybridization is indicative of pathological conditions.

Claim 36 of instant application is drawn to probes hybridizing to a single genomic location. Claim 1 of '997 patent teaches a nucleic acid probe complementary to a non-repetitive portion of genome. A non-repetitive portion of the genome would result in probes hybridizing to a single genomic location.

Claim 37 of instant application is drawn to detecting and delineating the extent of chromosome imbalances by comparison of probe hybridization to a standard genome map. Claim 1 of '997 patent teaches hybridization of nucleic acid of non-repetitive sequence probes with known genomic sequence coordinates. The hybridization of probes from claim 1 of '997 patent detect chromosome imbalances and since known genomic coordinates are known to delineate extent by comparison to standard genomic map.

Claim 39 of instant application is drawn to a method of utilizing a plurality of probes. Claim 1 of '997 patent teaches the use of a pair of probes, which is a plurality.

Claim 40 of instant application is drawn to detecting and delineating the extent of chromosome imbalances by comparison of probe hybridization to a standard genome map. Claim 1 of '997 patent teaches hybridization of nucleic acid of non-repetitive sequence probes with known genomic sequence coordinates. The hybridization of probes from claim 1 of '997 patent detect chromosome imbalances and since known genomic coordinates are known the specific chromosome arm is also known.

10. Claim 38 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7014997 in view of Bentz et al (Blood, 1994, volume 83 pages 1922-1928). Claim 1 of '997 patent teaches hybridization of nucleic acid of non-repetitive sequence probes with known genomic sequence coordinates. The hybridization of probes from claim 1 of '997 patent detect chromosome imbalances and since known genomic coordinates are known to delineate extent by comparison to standard genomic map. Claim 1 does not teach correlating imbalances with medical conditions including cancer.

However, Bentz teaches the D107F9 probe hybridization detects an imbalance in both chromosome 22 and 9 of the BCR-ABL positive cells (see page 1923, column 2, lines 1-4and figures 1 and 2). These imbalances are associated with ALL and CML, which are specific cancers. Bentz teaches BCR-ABL positive ALL patients have a poor prognosis and proper detection of the BCR-ABL phenotype allows treatment for this abnormality (see page 1927, column 1, lines 21-23).

Therefore, it would have been prima facie obvious to one of ordinary skill in art at the time the invention was made to use the method of claim 1 of '997 patent to detect

chromosomal imbalances and correlate them to ALL and CML as taught by Bentz. The ordinary artisan would be motivated to detect chromosomal imbalances associated with ALL and CML because it would allows directed treatment of this translocation, as taught by Bentz.

Summary

No claims are allowed over prior art cited.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven C. Pohnert whose telephone number is 571-272-3803. The examiner can normally be reached on Monday-Friday 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on 571-272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven Pohnert

Jehanne Sitton

JEHANNE SITTON
PRIMARY EXAMINER
9/5/06